

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A micro thermoelectric gas sensor comprising:

a membrane for heat shielding formed on a substrate; and

said membrane having,

a catalyst material on the membrane that induces a catalytic reaction in contact with a gas to be detected[[:]],

a thermoelectric conversion material film on the membrane that converts a local temperature difference produced by heat generation caused by the reaction into a voltage signal[[:]],

a microheater on the membrane that heats the catalyst material for temperature control for facilitating stable gas detection of the gas sensor formed, ~~which are on the membrane~~; and

a high-temperature section and a low-temperature section of the thermoelectric [[thin]] film formed on the same membrane.

Claim 2 (Original): The thermoelectric gas sensor according to claim 1, wherein the thermoelectric conversion material film is a segment of a thermocouple having a high-temperature section and a low-temperature section.

Claim 3 (Original): The thermoelectric gas sensor according to claim 1, wherein the thermoelectric conversion material film is a thermocouple having a high-temperature section and a low-temperature section, a plurality of the thermocouples are provided, and the plurality of thermocouples are connected in serial.

Claim 4 (Original): The thermoelectric gas sensor according to any one of claims 1 through 3, wherein a membrane with a thickness of 1 μm or less is obtained by wet etching a rear surface of the substrate.

Claim 5 (Original): The thermoelectric gas sensor according to claim 4, wherein a plurality of membranes are provided on the substrate.

Claim 6 (Currently Amended): The thermoelectric gas sensor according to any one of claims 1 through 3, wherein the thermoelectric conversion material film comprises a SiGe thin film, further comprising:

an insulating film ~~[[is]]~~ formed in a state of contact with the membrane on the membrane~~[[,]]~~;

a bonding film ~~[[is]]~~ formed on the insulating film in a state of contact with the insulating film and a heater material ~~[[for]]~~ serving to bond the insulating film and the ~~heater~~ microheater, and

a catalytic material layer ~~[[is]]~~ formed in thermal contact with said heater material being electrically insulated by the insulating film.

Claim 7 (Original): The thermoelectric gas sensor according to claim 1, wherein after a thermoelectric conversion material film pattern has been produced, the pattern is heat treated at a high temperature to improve crystallinity thereof.

Claim 8 (Currently Amended): The thermoelectric gas sensor according to any one of claims 1 through 3, ~~[[wherein]]~~ further comprising:

a SiGe thin film ~~[[is]]~~ formed as the thermoelectric conversion material film.

Claims 9 – 24 (Canceled).

Claim 25 (Currently Amended): The thermoelectric gas sensor according to claim 1, wherein the thermoelectric conversion material film extends in a linear section from a region of the catalyst material on a periphery of the membrane to a region of the microheater on an opposite periphery side of the membrane.

Claim 26. (Previously Presented): The thermoelectric gas sensor according to claim 25, wherein the thermoelectric conversion material film measures a voltage due to a temperature difference across the linear section.

Claim 27 (Previously Presented): The thermoelectric gas sensor according to claim 1, wherein a part of the catalyst material is disposed at a first periphery of said membrane and a part of the microheater is disposed at a second periphery of said membrane opposite the first periphery.

Claim 28. (Previously Presented): The thermoelectric gas sensor according to claim 27, wherein the thermoelectric conversion material film extends in a linear section from the first periphery to the second periphery.

Claim 29. (Previously Presented): The thermoelectric gas sensor according to claim 26, wherein the thermoelectric conversion material film measures a voltage due to a temperature difference across the linear section.

Claim 30. (New): The thermoelectric gas sensor according to claim 1, wherein on said same side,

the catalyst material is disposed on a first periphery of the membrane, and

the thermoelectric film extends from the first periphery in proximity to the catalyst material to a second periphery opposite the first periphery.